

**DSC1A**

June 2010

## **DSC BACKGROUND, FUNCTIONS AND OPERATIONS**

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## 1. INTRODUCTION

This Guidance Sheet, DSC1A, is provided for the guidance and direction of dam owners, and their consultants, to fulfil their dam safety role. The NSW Dams Safety Committee's (DSC) *normal requirements* are set out in its Guidance Sheets (see Appendix A for listing). However, *the DSC's* overriding policy is to determine appropriate dam safety arrangements in any particular case on the merits of the case. Where owners believe that a departure from the DSC's *normal requirements* is warranted, they should submit substantiated proposals for the DSC's consideration. The DSC welcomes discussion with owners, consultants and other stakeholders on any dam safety management matters.

Whilst owners should meet current DSC *normal requirements* as a minimum, they are ultimately responsible for the safety of their dams and will own the liabilities in the event risks are realized (see *Some Legal Considerations for Dam Owners - DSC2E* for owner liability guidance). Accordingly, they should be alert to their wider community and business responsibilities, and common law liabilities, with attention to risk management, in assessing and considering actions to ensure the long-term safety of their dams.

## 2. AUTHORITY

The provisions of the *Dams Safety Act 1978* and the *Mining Act 1992* provide the authority for the requirements of this Guidance Sheet.

## 3. SCOPE

This Guidance Sheet outlines the DSC's statutory functions and operations relating to the safety of dams and to providing regulatory advice on mining that could affect dams or stored waters. It applies to all "prescribed dams" (see Sect. 8.2) in NSW.

## 4. DSC BACKGROUND

NSW currently has around 350 prescribed dams and new dams continue to be constructed. These dams can be critical long-term assets, which cannot readily be replaced, but they may also have significant consequences if they failed. Accordingly, their proper functioning is an important matter of public safety and welfare.

Historically, each year, there have been several significant dam failures around the world along with many near-failures. Australia though, has an enviable safety record with only one fatal dam failure in Tasmania over eighty years ago, but a number of major Australian dams have suffered safety incidents. With effective surveillance, operation and maintenance, dams can perform satisfactorily over several centuries. However their safety needs to be constantly oversighted and reviewed taking into account changing conditions, along with any activities in the vicinity of dams, to determine their effects on dam safety levels and any requirements for their control.

With these factors in mind, in 1979, the DSC was constituted under the *Dams Safety Act 1978* to oversight the safety of the State's dams and to prevent significant uncontrolled loss of their storages. Further, in August 2006, the NSW Government endorsed a "Risk Management Policy Framework for Dam Safety" which is being progressively implemented by the DSC (see DSC1B for details).

## 5. DSC CONSTITUTION

The DSC consists of nine part-time members (see *Dams Safety Act 1978, Part 2*), with eight experienced in dam engineering and the ninth member providing mining experience input.

The DSC members meet regularly and consult widely on all matters associated with dam safety. A small professional staff assists the DSC, with administrative and accounting support provided by the NSW Department of Environment, Climate Change and Water.

## 6. DSC MISSION AND VISION

The DSC's mission is to "ensure the safety of dams".

Its corresponding vision is that:

- all dams meet a level of safety that is acceptable to the community; and
- the DSC inspires confidence in its stakeholders and is recognised for its technical excellence.

## 7. DSC GOALS

The DSC's approach to dam safety is goals-based as far as practicable, with its prime goal being that dams meet the DSC safety requirements set out in this and other DSC guidance sheets. Secondary goals are:

- Risks to community interests are identified, assessed and properly managed, are reduced when necessary, and are kept under review throughout the life of a dam;

- Risks to public safety meet the DSC's *public safety risk guidelines* [see *Background to DSC Risk Policy Context* - DSC1B - Section 2, under Principle D.3];
- Other risks with a potential for an adverse effect on community interests meet criteria set by the owner and agreed with the DSC;
- Needed safety improvements are undertaken *as soon as reasonably practicable*, in a way that best serves community interests;
- The DSC approach will facilitate a whole of Government approach to public safety.

It is for dam owners to determine how to achieve these goals (including DSC *normal requirements*) and to demonstrate to the DSC they have been achieved, or will be achieved following improvement(s) in their dams or safety management practices.

## **8. DSC FUNCTIONS AND OPERATIONAL ARRANGEMENTS**

**T**o achieve its dam safety goals, the DSC has implemented a range of operational arrangement, which align with its statutory functions (with corresponding powers and penalties) under the *Dams Safety Act 1978*, as summarized in Table 1.

**Table 1- DSC Functions and Operational Arrangements**

<b>DSC Act Sections &amp; Functions</b>		<b>DSC Operational Arrangements</b>
14(a)	- Maintain a surveillance to ensure safety of prescribed dams.	DSC requires 5-yearly Surveillance Reports on prescribed dams (see DSC2A and DSC2C) as well as Annual Reports on Ash and Tailings dams.
14(b)	- Ongoing examination / investigation of prescribed dams and environs.	See DSC2B for documentation and information flow over lives of prescribed dams - see also DSC2D.
14(c)	- Obtain information & keep records on matters relating to the safety of dams.	DSC obtains safety information from owners and keeps a reference library and database for its use and guidance of owners.
14(d)	- Formulate measures to ensure safety of dams.	Guidance sheets such as DSC2A and DS2D outline DSC measures for the safety of dams.
14(e)	- Make reports (to Minister) relating to prescribed dams' safety.	Meeting, annual, and any special, reports are forwarded for Ministerial action and the DSC Executive regularly meets with Minister.
14(f)	- Make reports & recommendations regarding prescription of dams.	Dams are prescribed in an annual gazettal process.
14(g) 14(h)	- Supplemental acts necessary for exercising its functions.	As required for general operational arrangements.
15	- Keeping and furnishing information on prescribed dams.	The DSC requests (but can demand) information from dam owners and maintains a related computerized Information System.
16/17	- Entry, inspection and testing of dams.	The DSC undertakes regular dam inspections and has express powers for this purpose, if required.
18	- Give notices to ensure safety of prescribed dams.	As required to ensure dams are made safe including that appropriate dam safety management programs are in place.
19/20	- Conduct inquiries relating to safety of prescribed dams.	As required.
21/22/23	- State of Emergency powers.	Recommend to the Minister, if necessary, to resource any emergency actions at dams to ensure dam safety.
26	- Investigation and research arrangements.	The DSC promotes research and has co-ordinated several dam research projects.

Some particular arrangements adopted by the DSC to facilitate its dam safety management functions are outlined in the following sub-sections.

### 8.1 Consequence Categories for Dams

The DSC's Consequence Category system is detailed in its Guidance Sheet on *Consequence Categories for Dams - DSC3A*). The Consequence Category is used to determine the need to prescribe a dam, the level and frequency of surveillance of a dam to ensure its continuing safety, and the extent and priority for some safety improvement measures.

### 8.2 Prescribed Dams

All EXTREME, HIGH and SIGNIFICANT Consequence Category dams, along with LOW Consequence Category Dams over 15m high, are PRESCRIBED under the Act on the recommendation of the DSC. However, all dams over 15m high, or with populations downstream, or containing toxic materials, should be referred for DSC consideration regardless of potential failure consequences.

### 8.3 Dam Surveillance

For all prescribed dams the DSC requires Surveillance Reports after the first substantial filling (or one year after completion, whichever is first), and subsequently at intervals not exceeding five years (See DSC2A and DSC2C for details). The type and content of report depends on the dam's Consequence Category.

In addition, for dams whose configurations and operations may change significantly during their lives (eg ash and mining dams), the DSC requires owners to submit Annual Inspection Reports to provide status updates (see DSC3F for details).

Through these reports, the DSC now has basic data on all prescribed dams in NSW. Also, through regular DSC inspections, and discussions with dam owners, active communication lines have been developed and are maintained with dam owners.

### 8.4 Safety Reviews

Safety Reviews should be carried out at regular intervals or where Surveillance Reports indicate that a dam may be unsafe (see DSC2D for details). They provide a vital input for any decisions on remedial / upgrading measures and involve a conclusive reassessment of dam safety using the latest investigative methodologies and information.

## 9. DAM OWNER REQUIREMENTS

The DSC obtains its basic information on dams through a series of requests sent out to dam owners (see DSC2B for details) at various key stages in the development of a dam. For new dams, the DSC's initial objective is to ensure that they are designed and constructed according to appropriate engineering standards and safety criteria. Accordingly, owners and designers must provide details of proposed dams for the

DSC's consideration at an early stage. After construction, dam safety is monitored by requiring prescribed dam owners to arrange for:

1. Proper operation and maintenance of their dams using trained personnel (see DSC2F, DSC2G, DSC2H for details);
2. Regular dam surveillance using trained personnel (see DSC2A, DSC2C);
3. Appropriate dam safety emergency plans (see DSC2G) to be in place for those dams whose failure could cause loss of non-itinerant life;
4. Ongoing assessment of dam behaviour on the basis of surveillance information (see DSC2A, DSC2C and DSC3B to DSC3G);
5. Periodic review of their dam's compliance with current DSC requirements (see DSC2A, DSC2D);
6. Review of all dam information and assessments by experienced personnel (see DSC2A, DSC2D);
7. Actions, in response to dam assessments, to ensure that their dams are maintained in a safe condition (see DSC2A).

Given that the safety status of a dam is affected by many variables (e.g. changes in downstream development, new assessment methods and criteria etc) the DSC will not "sign-off" on a dam's safety but will judge whether a dam meets current safety criteria. However, if the DSC considers that a prescribed dam is unsafe, or may become unsafe, it may give notice, under S.18 of the Dams Safety Act 1978, (and if necessary seek an injunction) requiring the dam owner to take such actions as are necessary to ensure the safety of the dam (see Diagram 1 - compliance flowchart for process).

## **10. DSC MINING FUNCTIONS, OVERSIGHT AND REGULATION**

**T**he DSC has statutory functions under the Mining Act 1992 where, through advice to the responsible Minister, the DSC plays a role in determining the type and extent of mining (predominantly coal) allowed near prescribed dams and their storages.

The DSC defines Notification Areas around prescribed dams near which mining may occur in the future. Mining leases granted within Notification Areas include conditions which require the leaseholder to apply for special permission to mine within the Notification Area at least 12 months prior to mining. When such an application is made, the DSC recommends to the Minister the extent and type of mining, which should be allowed, and the related monitoring and surveillance requirements for the mining

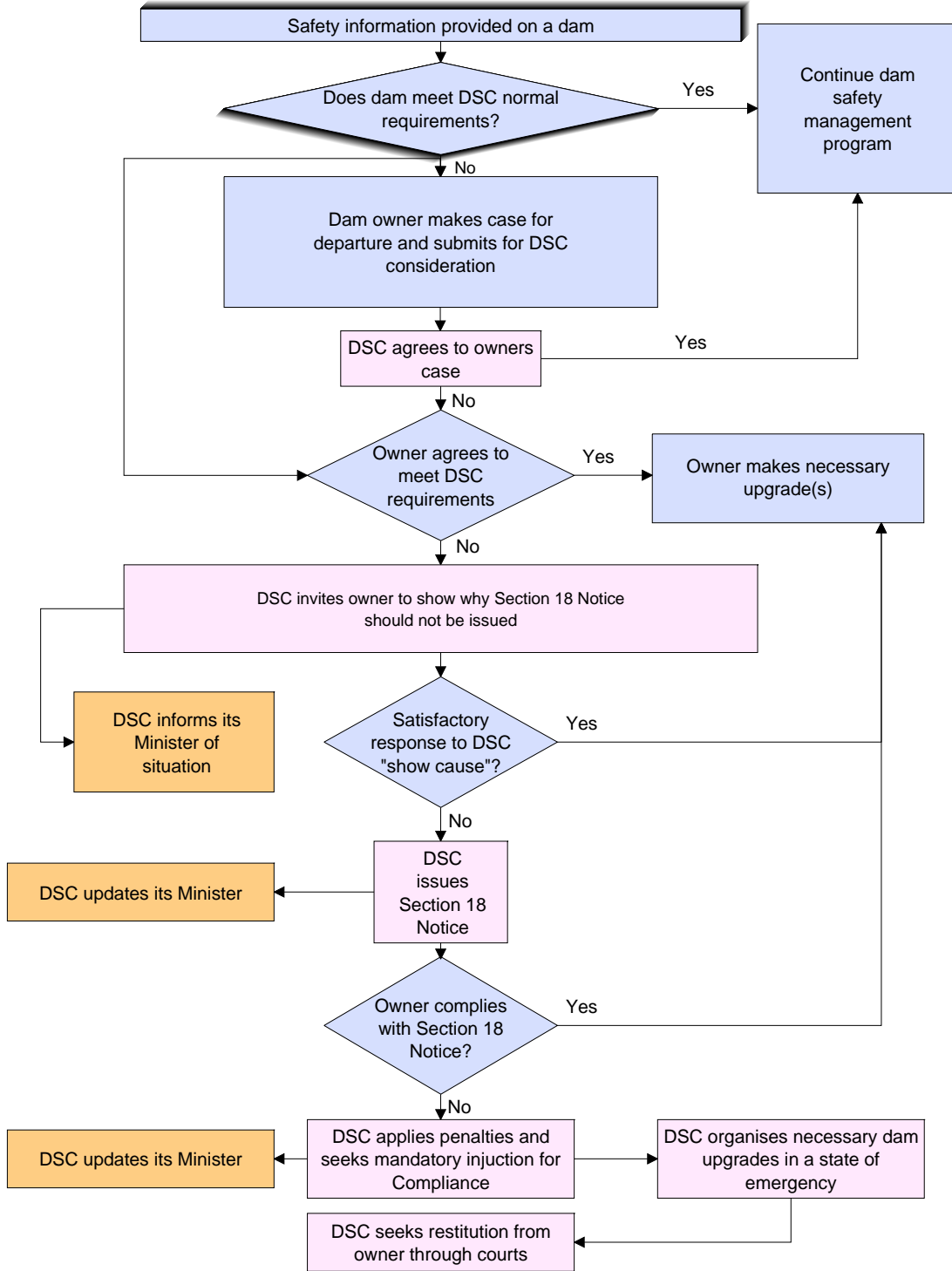
operations and the dam. In addition, the DSC may also oversight and control mining around dams under relevant provisions of the Dams Safety Act 1978.

The DSC will consider mining layout, the proximity to dams and storages, and the local geology when making its recommendations. The DSC Guidance Sheet on *Mining near Prescribed Dams - Administrative Procedures - DSC4A* provides more detail of the process of obtaining a lease within a Notification Area, and for mining within a Notification Area. The Guidance sheet on *Mining Applications - DSC4B* lists the aspects that the DSC will consider when reviewing an application to mine within a Notification Area. Generally, substantial mining near a major dam structure is not permitted.

Monitoring requirements normally include the preparation of geological plans and reports, the establishment and monitoring of subsidence and strain survey lines and the measurement of water inflows and outflows (see DSC4C). As part of this monitoring and surveillance requirement, DSC members and staff regularly inspect underground workings of mines. Typically, mining companies will also be required to develop contingency plans to mitigate the effects of any significant inflows (see DSC4D).



DIAGRAM 1 - DSC APPROACH TO DAM SAFETY COMPLIANCE



**APPENDIX A**  
**DSC GUIDANCE SHEETS REGISTER**

<b>Category</b>	<b>Sheet No.</b>	<b>Title</b>
DSC1 Background	DSC1A	DSC Background, Functions and Operations
	DSC1B	Background to DSC Risk Policy Context
DSC2 DSC General Requirements for Owners' Dam Safety Management	DSC2A	Dam Safety Management System (SMS)
	DSC2B	Documentation and Information Flow over Dam Life Cycle
	DSC2C	Surveillance Reports for Dams
	DSC2D	Demonstration of Safety for Dams
	DSC2E	Some Legal Considerations for Dam Owners
	DSC2F	Operation and Maintenance for Dams
	DSC2G	Emergency Management for Dams
	DSC2H	Dam Security
	DSC2I	Community Consultation and Communication (CC&C)
DSC3 DSC Particular Requirements for Owners' Dam Safety Management	DSC3A	Consequence Categories for Dams
	DSC3B	Acceptable Flood Capacity for Dams
	DSC3C	Acceptable Earthquake Capacity for Dams
	DSC3D	Reliability of Spillway Flow Control Systems
	DSC3E	Flood Retarding Basins
	DSC3F	Tailings Dams
	DSC3G	General Dam Safety Considerations
	DSC3H	Embankment Dams (being compiled)
	DSC3I	Concrete Dams (being compiled)
DSC4 DSC Requirements for Managing 3 <sup>rd</sup> Party Dam Safety Impacts	DSC4A	Mining Near Prescribed Dams - Administrative Procedures
	DSC4B	Mining Near Prescribed Dams - Mining Applications
	DSC4C	Mining Near Prescribed Dams - Management and Monitoring Matters
	DSC4D	Mining Near Prescribed Dams - Contingency Plans


This Guidance Sheet is one of a series available from our Website at:



<http://www.damsafety.nsw.gov.au>


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